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United States - Canada Agreement on Civil Emergency Planning

Hurricane Carla's Lessons

Control of Food Supplies Exposed to Fallout

Emergency Sanitation in Disaster

Santa Fe Civil Defence System

EMERGENCY MEASURES ORGANIZATION

THE EMO NATIONAL DIGEST

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The EMO NATIONAL DIGEST is published bi-monthly to provide current information on a broad range of subjects dealing with civil emergency planning. The magazine is published in English and French and may be obtained by writing to the Emergency Measures Organization, Daly Bldg., Ottawa.

In addition to publishing articles which reflect Canadian Government policy the Digest may also publish articles by private individuals on subjects of current interest to the emergency measures programme. The views of these contributors are not necessarily subscribed to by the Federal Government.

Director: R. B. CURRY. *Editor:* A. B. STIRLING.

ROGER DUHAMEL, F.R.S.C.
QUEEN'S PRINTER AND CONTROLLER OF STATIONERY
OTTAWA, 1964

UNITED STATES-CANADA AGREEMENT ON CIVIL EMERGENCY PLANNING

His Excellency,
Paul Martin,
Secretary of State for External Affairs,
Ottawa.

Excellency:

I have the honor to refer to recent discussions between authorities of our two countries concerned with civil emergency planning and civil defense matters. These authorities have concluded that planning in our respective countries in these fields has reached a stage at which it would be mutually advantageous to revise the liaison arrangements between the two countries and to establish direct channels for detailed and technical consultation on civil defense, the use of resources in emergencies, and other aspects of civil emergency planning.

I am instructed by my Government, therefore, to propose a new agreement on Joint Civil Emergency Planning in our two countries, which would replace the United States-Canada Agreement on Civil Defense Cooperation of March 27, 1951.

As far as possible, civil emergency planning activities in the United States and Canada should be coordinated for the protection of persons and property from the results of enemy attack as if there were no border. It is, therefore, proposed that there be a Joint United States-Canada Civil Emergency Planning Committee with responsibility for making recommendations to the two Governments, their departments and agencies, concerning plans and arrangements for cooperation and mutual assistance between the civil authorities of the two countries in the event of an attack on either country. This Committee will include the Secretary to the Cabinet of Canada, the Director of the Emergency Measures Organization of Canada, the Director of the Office of Emergency Planning of the United States, the Assistant Secretary of Defense (Civil Defense) of the United States and such other representatives as may be designated from time to time. Joint Secretaries for the Committee will be provided by the Department of External Affairs of Canada and the Department of State of the United States. The Committee will meet at least once in each calendar year at such times and places as may be agreed upon.

It is further proposed that the Committee may arrange for direct communication between such national authorities of Canada and of the United States as the Committee considers to be concerned with aspects of civil emergency planning in either country likely to be directly affected by comparable planning in the other. The Committee may also facilitate the exchange of information on aspects of civil emergency planning of a purely

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national character. However, subjects relating to the determination of intergovernmental policy with regard to civil emergency planning will be discussed by the two Governments through normal diplomatic channels.

It is proposed also that the Committee, within its general field of competence, may establish such sub-committees and working groups as it considers necessary to advance joint planning and that the Committee may make arrangements to facilitate joint United States-Canadian civil emergency planning by the appropriate public authorities, within their respective jurisdictions, of those states, provinces, and municipalities which are adjacent to one another along the international boundary.

If the Government of Canada concurs in these proposals, I have the honor to propose that this Note and your reply to that effect shall constitute an agreement between our two Governments on Joint Civil Emergency Planning. This agreement shall supersede the agreement of March 27, 1951 and may be terminated by either Government upon thirty days' written notice.

Accept, Excellency, the renewed assurance of my highest consideration.

(Sgd.) "W.W. BUTTERWORTH"

Embassy of the United States of America,
Ottawa, November 15, 1963.

His Excellency
W. Walton Butterworth,
Ambassador of the United States of America,
Ottawa.

Excellency:

I have the honour to refer to your Note of November 15, 1963, concerning proposals which would govern joint civil emergency planning between our two countries.

The proposals contained in your Note are acceptable to the Government of Canada and it is agreed that your Note and this reply thereto shall constitute an agreement between our two Governments which shall enter into force on the date of this Note.

Accept, Excellency, the renewed assurances of my highest consideration.

(Sgd.) "PAUL MARTIN"
Secretary of State
for External Affairs

HURRICANE CARLA'S LESSONS FOR CIVIL DEFENSE

MAJ.-GEN. H. M. PENHALE

The former commandant of the Canadian Civil Defence College explains how a prepared emergency plan in the southern United States helped half a million people escape "one of the worst disasters ever to hit the continent".

Now that a partial test-ban treaty has been signed by the great powers, and with the appearance of improved relations with Soviet Russia, numbers of people seem to believe that it has become pointless and unnecessary to spend so much time and effort to support civil defense in Canada. Perhaps as a form of insurance we should keep up emergency planning at the federal and provincial levels, people say, but at the municipal level, people are far too busy with their own affairs to recognize or be concerned with a problem which, from their viewpoint, appears not to exist.

Should a local emergency or disaster occur, the civic authorities are there to deal with it. If outside help or financial aid is necessary, the provincial and federal governments will give their support. And the army is now organized and available to take over in time of stress and to direct the efforts of thousands of civilian volunteers who would come forth in a spirit of public service whenever called upon.

You may remember Hurricane Carla. It has been described as "the greatest hurricane in recorded coastal history. Carla packed the power of an estimated several hundred nuclear devices, and triggered a test of evacuation capabilities far in excess of exercises which civil defense planners had been able to achieve."

Canadian civil defense officials are now circulating copies of a report on Carla*, prepared by a senior Texas civil defense officer, Mattie E. Treadwell. It is a moving and dramatic account of one of the worst disasters ever to hit the continent. The report was commissioned by the U.S. Department of Defense, Treadwell says, "in order to obtain a command evaluation of the operation . . . to make its lessons available for current (civil defense) planning. . ."

The property damage from high winds (up to 175 m.p.h.) and 18-foot tides with huge rolling waves 40 feet high was indescribable. Debris picked up by the waves from the beach was hurled 11 stories high. A house in Palacios sailed over a fence into a pasture leaving the fence intact. Large ships were lifted and crashed into pastures blocks away. Houses vanished. The beach moved inland 200 feet or more. A whale weighing nearly a ton was stranded on the beach.

In Texas City, 125 miles away from the eye of the hurricane, all but 300 or 400 of the city's 11,000 homes were flooded. Even at a distance of 240 miles water was waist high in the streets of one town. Live and dead cows were found in living rooms of evacuated homes. One man returning to his home near Freeport found "a dead Brahma bull in the garage and two pet ducks swimming in the living room . . . two live cows had taken refuge in a neighbor's kitchen. . . ."

Texas lost an estimated 50,000 head of cattle. In Louisiana, however, some 150,000 cattle were evacuated to safety. The highways in this area were a mass of dead fish, mink, muskrats, coons, and other forms of wildlife (but not cattle). The higher ground crawled with snakes—in the debris, on roads, in water-soaked homes, in beds, and even crawling out of bath tub drains. Fortunately only a few cases of snake bite were reported.

For miles inland and mixed up with garbage and debris were live electric wires: they lay on the ground, across automobiles, everywhere.

The overall estimate of property damage was placed at approximately half a billion dollars. In spite of this the total of lives lost and persons injured was amazingly low. In the two states the total deaths amounted to only 43, according to weather bureau and Red Cross estimates. Most of those who died had refused orders to evacuate and therefore their deaths could be called preventable. According to a Houston newspaper, this remarkably low total was due entirely to the existence of a disaster plan that included evacuation of personnel from the threatened areas. "Without the magnificent job which the Civil Defense people did in evacuation we would have had loss of life into the thousands."

There is a moral in this tale for us here in Canada. The plans made in the U.S. were primarily intended to deal with an emergency arising from a threat to national survival. They advocated the evacuation of population from threatened areas if time permitted. Provision was made for transportation and movement, organization of reception areas, emergency housing, feeding, welfare, and medical care. The organizations included rescue and first-aid units, auxiliary police, and a warden service—the basic structure for civil defense. A warning system, of course, and emergency communications. All this within the scope of civil defense, closely

*112 pages, many pictures. Copies available from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., at 55 cents each.

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integrated with and augmenting existing municipal services such as fire, police, engineers, transport, doctors, nurses, etc. *Above all, and well in advance of the disaster, the people were kept informed by all news media of the nature of the threat, the details of the plan, what they had to do, and where to look for leadership.*

In the event, the operations were carried out without panic. There were few casualties; no arrests; few accidents, breakdowns, or traffic jams. In fact most authorities on the spot agreed that had all routes and traffic lanes been marked for outgoing traffic only, the evacuation of practically the total population affected, variously estimated as between 500,000 and 850,000, could have been carried out in less than half the time. This result could not have been achieved had not the population been kept informed. The moral, I suggest, is *plan, but tell the people.*

Already in our short history we have had several examples of emergencies arising from accidental and natural causes:

- 1917—Halifax explosion—30,000 homeless; 10,000 injured; 1,635 killed. Property loss $30,000,000.
- 1948—Fraser River, B.C. flood—Interruption of civic services and great property damage. Armed services took over.
- 1950—Red River, Man. flood—Operation Red Ramp. Army took over. More than 10,000 homes damaged or destroyed.
- Rimouski and Cabano fires—Army called upon to assume control.
- Sarnia tornado—Great property damage.
- 1954—Hurricane Hazel—82 dead. 409 inches of rain. Property damage $25,000,000.

In Halifax in 1945 a serious fire was started by an explosion at the Navy's Bedford Basin magazine. Another disaster was feared. This time, however, a civil defense organization and plan had been established. As a result a warning was issued and some 25,000 people moved out of the threatened area in orderly fashion. Fortunately the fire was kept under control and there was no major loss of life.

All peacetime disasters produce problems that are similar to those caused by enemy action. The public must be made aware of the implications. Warnings must be issued. The movement of population must be controlled; hospitals and schools must be evacuated; homeless people must be fed and provided with emergency housing and shelter, first aid, and medical care. Clearance of routes, mobilization and assembly of relief personnel and equipment must be provided for—all this on a preplanned basis.

There is, in fact, a common problem in preparing for emergency operations: that of using all elements of organized communal life—the police, the volunteer firemen, the armed services, the Red Cross, St. John Ambulance, telecommunications, transportation services, private and public sources of power and energy. Above all we must provide for continuity of government. All this adds up to a task of great magnitude. But it is not beyond our capabilities if we approach it with the will to survive. Let us take another look at Hurricane Carla to see how and in what degree this was accomplished.

I refer to some of the more significant aspects in the following paragraphs. *But note that in spite of careful planning and preparations made at higher levels, final decisions were made at the municipal level. "The final frightening responsibility for decisions affecting citizens' lives fell upon local officials. . . ."*

In fact, it was soon fully realized by officials and public alike that civil defense in reality was neither more nor less than local government.

The following quotes are taken from the Carla report:

"For 500 miles along the coast residents and store owners taped or boarded windows. . . . Lawn furniture, garbage cans, and other loose objects were carried indoors. . . . Housewives hurried to lay in supplies. . . . Bath tubs and bottles were filled with drinking water . . . candles, kerosene lamps, canned heat, and other emergency lighting and cooking supplies were purchased . . . suitcases were packed and loaded into cars ready for evacuation when the call came. . . Everyone was galvanized into action by the memory of Audrey."

All government agencies, of course, had developed this sense of awareness as a result of past experience with disasters. At least two hurricanes have reached the Atlantic and Gulf coasts each year during the past decade. Tornadoes occur in the U.S. an average of 200 times a year. Floods continue to be a yearly threat in many areas, including Canada. Fires ravage over wide areas, particularly in our own forests. The effects of these can be likened in some degree to those from a nuclear blast. The wind and tide effect of Carla caused far more damage to property than the famous 1947 explosion that destroyed a large part of Texas City.

Thus, following these disasters, and especially Hurricane Audrey (1957), the general public in Texas and Louisiana had become conscious of the need for planning and preparation, and therefore receptive and responsive to positive leadership and direction. This awareness was based upon the knowledge conveyed to them by civil defense and other agencies before the event of the type of warning, evacuation plans, routes to be followed, organization of reception areas, shelter control, and re-entry procedures to be expected.

The head of the Texas Department of Public Safety, Col. Homer Garrison, said: "Often we feel that people are not concerned with civil defense, but when the time came they must have absorbed some of it or they couldn't have responded so well."

Evacuation—The classic example of successful planning and organization of evacuation occurred in Jefferson County. This area includes eight separate cities comprising one large metropolitan area with a population of some 300,000. A survival plan had been prepared by the civil defense co-ordinator and staff; this had been approved by all eight chief magistrates and the county judge. Police, fire, and all government officers had participated in the planning and everyone knew exactly what routes and destinations would be designated, what means of control and communications would be used.

Above all the public had been instructed and the plan had been practised on paper by the officials concerned no less than four times. All this was based upon an imaginary wartime emergency fallout situation. These "enemy attack plans" applied in the present emergency and were followed almost to the letter by officials and public alike.

The warning was issued to news media at 10.30 a.m. By noon traffic was bumper to bumper, and by 6 p.m. the movement was practically completed. Some 308,000 people had cleared the area by designated routes in approximately six hours. Only outgoing traffic lanes were used: so this time could have been cut in half if the actual wartime plan of using all lanes for outbound traffic had been followed.

The success of the movement surprised everyone. "It was gratifying to learn how people do co-operate... There was no griping or hard feelings ... breakdowns were scarce ... practically no personal accidents ... no sign of panic or recklessness."

Many authorities credited this successful result to the outstanding contribution made by all news media in preparing the public for what was to follow. Radio and television especially were effective. As a result, people were ready, packed, and waiting to be told when to go.

Reception and Shelter—Here again Hurricane Carla demonstrated the value of advance planning. Many evacuees went as far as 400 miles to find their own emergency accommodation. Most of these probably went to relatives or friends. The American Red Cross planned for emergency care and shelter for approximately one third of the total number. This estimate apparently was borne out, which meant that some 480,000 persons found their own private housing. Hotels and motels, private homes, all were made use of. No panic situations were noted and the response from citizens of the towns in safe areas was remarkable.

The American Red Cross had been made responsible during advanced planning for the operation of public shelters to be established in schools, auditoriums, churches, coliseums, theatres, YMCA buildings, labor halls, Legion posts. Schools are the best, since they are as a rule staffed and equipped to accommodate, feed, and provide toilet facilities for large numbers. "Within two days the Red Cross had set up some 540 shelters in Texas and 116 in Louisiana—the largest operation of its kind in American Red Cross history." In nearly all cases these plans were effective and well managed.

Difficulties were encountered occasionally. Some locations not included in the planning were taken over by refugees without adequate or even any supervision. The moral is that we must plan and provide for the manning and organization of mass public shelters, and of equal importance we must provide in advance for control and direction of the movement of population into these areas. This is one of the prime aims of civil defense, and surely we must practise it in peacetime if it is to be effective in war.

Re-Entry—The problem under this heading would be vastly different and more serious under war conditions than in any natural disaster. Destruction in many areas would be complete, but above all movement would become subject to fallout. The armed services have been given the responsibility of undertaking and controlling this part of the problem, including rescue operations, monitoring, and population control. Much has been accomplished here in Canada in this direction, but the armed services have insufficient numbers trained and available to carry out their task.

In the case of Carla, this part of the problem "proved much more of a headache than the much-feared evacuation". The urge to return and check their property and possessions against the damage caused by the elements, and concern and fear that looters would ransack their homes, was everywhere prevalent. In no time, when the storm had ended, a bumper-to-bumper situation developed on return routes. Resentment at being held up by traffic control road blocks was much in evidence. No insurmountable situation arose, however, and the return was completed without serious trouble. But there was a general recognition on the part of the authorities that in a wartime situation much more control must be exercised.

Let's face it—in spite of a brighter outlook, test ban treaties, wheat deals, and smiles from Mr. K., it would be unwise to assume that there has been any real departure from the Communist objective of world domination and Mr. K.'s intention "to bury us". At this stage the thing to keep in mind is that if we plan for the worst case, we are at the same time making arrangements to deal with situations like Hurricane Carla. Public awareness of the nature of things, the need for an adequate warning system, evacuation planning, reception areas organization, re-entry, command and control—all these are essential. In all these aspects, some civilian organization such as civil defense is a prime requisite.

We should all understand that there is no complete defense, so far, against nuclear weapons in this or any

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other country. Therefore we must accept the philosophy of the deterrent as being the best way to preserve peace. "The object is to prevent war rather than to prepare for it." Civil defense becomes an important aspect of the deterrent.

If we become subject to nuclear attack, some 16 populous centres in Canada are likely to become target areas. Population is the target. According to the experts, in such an event at least 3,500,000 people could be killed and 1,250,000 injured out of a total of more than 5,000,000 in these areas; the remainder, at best, would become homeless refugees, and would have to receive succor and care in surrounding communities.

Hurricane Carla demonstrated the value of advanced planning and public awareness. All the countries of the Free World and even our "friendly enemies" on the other side of the Iron Curtain look upon civil defense as a vital element of defense planning. Here in Canada should we not take profit from the experience of others and press for a more informative and positive direction in these matters of such vital concern to our security and survival? ▲

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HOAX LETTERS

Over the past two years copies of a bogus letter have been distributed in large numbers. The letter purports to appoint the recipients as "Atomic Raid Wardens" or some similar term, for a particular area.

The letters themselves give alleged details of the responsibilities of "Atomic Raid Wardens", and in most cases there is attached to each letter a list of equipment "necessary for each Atomic Raid Warden". On reading the list of equipment the recipient usually realizes that the letter accompanying it is a hoax. There have been cases, however, where people receiving the letters have thought they were genuine, and that they had, in fact, been forwarded by the Civil Defence Organization.

In New South Wales the appropriate Commonwealth and State authorities have been investigating the matter. There is no doubt that in some cases they are posted by people thinking they are playing a joke on some friend or business associate, but it is believed that behind the whole idea could be the motive of bringing discredit on civil defence. Those who in pure innocence send the letters as a joke are furthering the ends of the people whose aim is to have the letters distributed. They are saving the real instigators a lot of money for production costs and postage.

With the aid of the appropriate authorities one of our Regional Controllers has in two instances found out the persons concerned with reproducing batches of the letters.

It is known that similar letters have been distributed in all other Australian States, and in New Zealand and the United Kingdom.

A news report in the Launceston (Tasmania) *Examiner* of August 2nd, 1963, indicates that not only in New South Wales, but elsewhere as well, a serious view is taken of the letters. The *Examiner* reports:

"Hoax letters purporting to come from civil defence headquarters in Hobart were being investigated by the Commonwealth security service, the Premier (Mr. Reece) said yesterday.

"Many Tasmanians had received letters in recent weeks informing them that they had been appointed atomic air raid wardens.

"Most people had realised that the letters were a hoax, but some had accepted them as genuine.

"Those who had been amused by the letters should realize that there was a less amusing side to the affair, Mr. Reece said.

" 'The regular appearance of these letters in all states over the past two or three years had led civil defence authorities and the Commonwealth security service to believe they are the result of an organised attempt to discredit civil Defence', Mr. Reece said.

" 'Having started the letters, the organisers can depend on some irresponsible person in the community to spread them.

" 'This aspect has been under investigation by the Commonwealth security service, and the latest outbreak in Tasmania has been reported to the service'." ▲

THE CONTROL OF FOOD SUPPLIES EXPOSED TO FALLOUT[1]

E. E. Ballantyne, V.S., D.V.M., F.R.S.H.
Director of Veterinary Services
Alberta Department of Agriculture

IN the case of a national emergency the first priority will be saving human lives. Provision of a safe wholesome food supply is the second priority and in essence it is an integral part of the first. Without food welfare services, industry, reconstruction and rehabilitation would all collapse and the recovery of the nation would be severely endangered. People must have food to survive. Food resources are the prime responsibility of provincial departments of agriculture assisted by the Federal Department of Agriculture for some inspection services.

Vancouver, Edmonton, Calgary, Winnipeg, Windsor, Niagara Falls, Hamilton, Toronto, Ottawa, Montreal, Quebec, St. Johns, and Halifax are listed as probable nuclear warfare targets in Canada. These are the key cities, too, for the preparation and warehouse storage of prepared foods. Direct hits on these cities could greatly reduce or eliminate food supplies which ordinarily are readily available to feed many millions of Canadians. The processing plants, bakeries, etc. in these target cities would disappear too or be rendered useless. Processed foods such as canned goods, prepared cereals, meats and eggs in cold storage, abattoirs, supermarkets, stored in other cities would last for only a short period of time. Many of these supplies might be in centers contaminated by radioactive fallout. A considerable percentage of this food could be salvaged and utilized by applying the principles of wholesomeness and decontamination established by the Emergency Health Services.

The control of food supplies exposed to fallout may be considered in two parts. *The short-term situation* (probably 1-2 weeks) is the minor part of the problem. This involves stored foods already processed. The *long-term situation* is the major problem. This relates to foods which are to be produced and processed. Except for fish this problem is the concern of the agricultural industry.

The veterinary profession is responsible for the final decision as to the wholesomeness and safety of foods. The decisions would be based on the standards established by Emergency Health Services.

For proper perspective, it should be mentioned that based on calculations to date, the food resources in vast areas in Western Canada will be unaffected by fallout. This will be the main immediate source of a safe wholesome food supply, provided distribution facilities are reasonably adequate.

Using the geographical basis to analyze further the potential general food situation in the case of a heavy nuclear attack on targets in Canada and the United States, possible gamma radiation figures (2) are presented in Table I.

TABLE I—Possible Gamma Radiation Dose Between 50% and 90% of Time During 96 Hours After a Nuclear Bomb Detonation

Ontario		
Barrie	291.5 rads to	1,340 rads
Blind River	383.4	2,203
Chatham	1,718.8	5,610
Guelph	382.0	2,670
Kapuskasing	0.0	173
Kingston	325.4	2,989
Peterborough	292.4	2,253
Stratford	569.8	3,879
Saskatchewan		
Meadow Lake	24.6	664
Regina	0.0	252
Saskatoon	0.0	242
Alberta		
Athabasca	0.0	20
Brooks	0.0	468
Drumheller	0.0	610
Grande Prairie	0.0	0.0
High River	0.0	739
Lethbridge	0.0	510
Tofield	75.0	699
Wainwright	0.0	333

These figures, when compared with the median lethal dose for domestic animals in Table II (3), are presented to emphasize the fact that there is a distinct possibility that many animals in Ontario out to pasture during a summer attack, or inadequately sheltered, would have to be salvaged immediately, as they would die due to total body gamma radiation. The same situation may be true for Quebec and the Maritimes.

It is evident that the least affected food resources will be in Western Canada, because of vast unaffected areas and less radiation even in fallout areas.

The survival of animals exposed to protracted radiation exposure (Table III) also would have a definite bearing on food supplies of animal origin (4).

Without doubt, the effects of radiation will be disturbing but the key problem with food will be the longer term one of radioisotopes getting into the food chain in cereals and vegetables, or through water, forage and other feeds ingested by animals, with all the resulting

ramifications, and hazards to human health. Radioisotopes of public health importance are well known, iodine 131, cesium 137, and the most significant one, strontium 90. This is due to its half-life of 28 years, its ability to be absorbed by plants and animals, its chemical similarity to calcium, its affinity for bone with beta effects on the hematopoietic system, its presence in bovine milk, a key human food, especially for the young.

TABLE II—Percent Mortality of Various Species of Animals Following Exposure to a 24-Hour Gamma Radiation Dose. Exposure Dose in Roentgens

		Cattle	Sheep	Swine	Poultry
Unsheltered	100%	650	700	800	1200
	50%	550	525	600	900
	0%	300	350	350	400
Sheltered*	100%	Would require 5× the dose rates above.			
	50%				
	0%				

*Two-storey basement type barn with a loft filled with hay.

TABLE III—Comparison of Brief Vs. Protracted Exposure and the Median Lethal Dose

		MLD Protracted Exposure		
Species	MLD Single Dose (r)*	Dose Rate (r/day)	Average Accumulated Exposure Dose (r)	Ratio
Burro	800	50	1500	2
Guinea Pig	500	25	1700	3
Rat	800	25	8300	10
Pig	600	50	8500	14

*r = roentgens.

Control Procedures

The principle is one of preventing injury to the health of people by permitting only food to be consumed that is wholesome and safe according to the safety standards specified by the Emergency Health Services and to prevent starvation by having adequate amounts of food.

Emergency Measures Plan, Department of Agriculture, Alberta

The plan outlined was proposed by the writer and accepted by Alberta.

Alberta in peace-time produces approximately 30% of the red meat in Canada but consumes only 7%. The province has approximately 1,000,000 acres of irrigated land, producing a considerable quantity of vegetables, wheat and specialty crops. This illustrates the province's strategic position in food resources in a national emergency. The Alberta plan to provide safe food supplies is, therefore, important to all Canadians.

Establishing a Quarantine Area

To safeguard human health, to avoid chaos and wastage of manpower, the Alberta plan calls for quarantining the fallout area at the 5 roentgen line calculated back to zero plus one hour. The authority for such action is vested in the Civil Defence and Disaster Act of the province. The order would be made by the Provincial Co-ordinator, on the advice of the Agricultural Emergency Measures Committee and the Emergency Health Services after ground readings were available to delineate the fallout area. In this connection it would be wise to err on the side of safety until detailed ground monitoring, calculations, and plotting could be carried out. The quarantine line could then be adjusted accurately to the closest road outside the affected area. The co-ordinator's order would go to the Zone Emergency Measures Headquarters in the territory where the fallout occurred, the order would be transmitted to the Civil Defence directors of the municipalities involved. Quarantine signs would be posted on the roads entering the areas. It would be important to have radioactivity readings taken by monitors recorded at road intersections or along roads on the first round of monitoring. In Alberta, the plan calls for a trained monitor in every township in agricultural areas with veterinarians, district agriculturists, field supervisors and forest rangers as radiological officers. Over 500 are already trained. The country or municipal district agricultural emergency measures committee would give full assistance.

Functioning of the Quarantine

This quarantine procedure would:

- Prevent any contaminated milk, meat, eggs, cereals, vegetables, etc. from entering the food chain in the non-contaminated areas.
- It would also permit organizing trained technical staff and a labour force for salvaging purposes, decontaminating processing plants, buildings, etc. keeping in mind the human hazards involved, rather than permitting people not under medical and radiological supervision rushing about doing such work or other farm activities until advised that it was safe to do so.

Immediately after the bombing, advance planning would be taken by the Provincial Agricultural Emergency Measures Committee by activating the Fallout Area Utilization Committee, followed by directions to the agricultural committees at zone and municipal levels.

The policy to be followed would be formulated by the Fallout Area Utilization Committee after adequate scientifically reliable information was available as to the actual situation in the fallout area. Implementing the policy would be the Alberta Department of Agriculture and the municipal

agricultural emergency committees, salvaging food supplies when safe to do so and handling the long-term problem of food resources from the affected area. A trained veterinarian would be a member of agricultural committees at all levels to recommend final decisions as to the safety and wholesomeness of food and to make decisions concerning the health of livestock.

Action would include the utilization of and procedure concerning soil, water, crops, vegetables, livestock, livestock products, processing, marketing, etc. in the best interests of the area and with the ultimate objective of safeguarding the public. The purpose of establishing this committee is to pool the best technical knowledge available from specialists so that the area will be handled as a complete entity.

Provincial Agricultural Emergency Measures Committee

The Committee would consist of nine members with the Director of Veterinary Services, Alberta Department of Agriculture as chairman. Three members would be named from the University of Alberta (a physicist, soils scientist, and animal scientist); three members from the Department of Agriculture of Alberta (field crops, veterinary services, dairy); one from the Provincial Department of Health, one from the Federal Department of Agriculture (marketing) and one from industry (a packer or dairy plant operator).

Activities of Provincial Agricultural Emergency Measures Committee

- Monitoring and radio-chemical analysis to determine the exact facts concerning contamination.
- Salvage of food supplies stored in processing plants, warehouses, etc. to be released to the War Supplies Agency.
- Decontamination crews for dairies, slaughterhouses, farm buildings, etc. under the supervision of a trained radiological officer.
- Decontamination of soils when possible.
- Changes in cropping practices to reduce amount of Strontium 90 etc. in biological and food chains.
- Long term quarantine on area, in total or part, for many years.
- Decontamination of milk at dairy plants.
- Rehabilitation of farmers in "hot" areas, protecting land titles, etc. as some areas may be "out of bounds" for 30 years or longer.
- Orderly and controlled slaughtering of all livestock at special "designated" slaughter houses for many years.
- Arranging, for "designated slaughter houses" where adequate monitoring, decontamination, radio chemical tests, veterinary inspection, safe disposal of wastes, etc. could be carried out. Any large federally inspected packing plant with some alterations could adequately fulfil this capacity.

Examples of Control Measures

Animals from the quarantined area that had to be slaughtered because of the effects of external radiation and those which had ingested radioisotopes would be sent to designated slaughter houses where special handling methods, including veterinary inspection, would be available. This procedure would be similar to the current one of sending bovine T.B. reactors to designated federally-inspected abattoirs. It might be advisable to have decontamination depots at the periphery of the area to remove residual fallout from trucks, cattle, etc. Milk from cows consuming radioactive forage grown on radioactive soil would go to special dairies for decontamination (6) before being made into cheese, butter, dried milk, dried buttermilk, etc. Or, it could be fed to pigs, calves, and poultry which would be slaughtered at the designated slaughter houses.

As many of the large federally inspected abattoirs which supply 80% of the meat consumed in Canada might be non-existent or inoperative due to lack of utilities, smaller country slaughter houses would have to be activated and veterinarians assigned for inspection and monitoring. Again this would be an activity of the Agricultural Emergency Measures Committee of the Provincial Department of Agriculture to organize, plus arranging for sufficient animals for slaughter to supply the requirements for welfare, the armed forces, and civilians. Processing facilities for meat, milk, eggs, etc. outside the fallout area would be utilized to the fullest. All this effort would require co-operation between several divisions of the Emergency Measures Organization such as agriculture, Emergency Health Services, communications, transport, police, supplies, etc.

In conclusion, the food supply problems are many whether in or out of the fallout area. Planning, organizing, and educational work should be done now to prevent chaos, starvation and unnecessary health hazards.

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ANNOUNCED NUCLEAR TESTS

JULY 16, 1945 TO SEPTEMBER 24, 1963

Not including the two combat explosions at Hiroshima and Nagasaki in May and September 1945, each of which produced a "nominal" yield.

The explosive energy yields from nuclear bombs are expressed as the equivalent of the energies released by exploding tons (T), kilotons (KT), and megatons (MT) of TNT. 1 KT = 1000 T; 1000 KT = 1 MT = 1,000,000 T of TNT equivalent.

Explosive Energy Yields of Nuclear Bombs	*Equivalent Energy Yields from TNT*
low	less than 20 KT
nominal	about 20 KT (20,000 T)
intermediate (int.)	20,000–1,000,000 T (20 KT-1 MT)
high	1 MT and over
all other terms	no definitions given

NS: Yield not stated; H: thermonuclear bomb (when stated); rg: range

Year	United States		Soviet Union		United Kingdom		France	
	Tests	*Yield* (1)	*Tests*	*Yield* (1)	*Tests*	*Yield* (1)	*Tests*	*Yield* (1)
1945	1	19 KT	—	—	—	—	—	—
1946	2	nominal	—	—	—	—	—	—
1948	3	104 KT	—	—	—	—	—	—
1949	—	—	1	NS	—	—	—	—
1951	13	159 KT	2	NS	—	—	—	—
	3	NS						
1952	8	104 KT	—	—	1	KT rg	—	—
	1	high						
	1	H, NS						
1953	11	252.4 KT	1	NS	2	KT rg	—	—
			1	H, NS				
1954	4	NS	1	NS	—	—	—	—
	1	100 KT						
	1	H, 15 MT						
1955	15	197 KT	3	NS	—	—	—	—
			1	MT rg				
1956	12 (2)	NS	4	NS	2	low	—	—
	1	KT rg	1	less than MT	4	KT rg		
	1	H, several MT	2	large				
1957	26 (3)	344.2 KT	6	NS	1	low	—	—
	2 (4)	slight		small	2	KT rg		
				moderate	4	MT rg		
			1	MT rg				
			1	substantial				

			1	substantial				
			2	large				
			1	H, substantial				
1958	29	NS	[illegible]	NS	2	KT rg	—	—
	35 (5)	61.8 KT	2	small	3	MT rg		
	2	MT rg	2	relatively low				
			1	medium				
			2	moderate				
			2	moderate to high				
			2	relatively large				
			3	below MT rg				
			7	large				
			2	MT rg				
1960	—	—	—	—	—	—	2	small
							1	65 KT
1961	8	low	2	low	—	—	1	small
	1	3 KT	9	low to int.				
			1	low KT rg				
			2	less than 1 MT				
			2	int.				
			5	about 1 MT				
			8	several MT				
			1	about 25 MT				
			1	55–60 MT				
			19 (8)	NS				
1962	1	NS (Polaris)	1	NS	2	low	1	medium
	56	low	6	low				
	1	100 KT	1	low KT				
	22	int.	1	a few hundred KT				
	2	sub-MT rg	14	int.				
	5	low MT rg	1	less than 1 MT				
	3	MT rg	1	low MT				
			2	MT rg				
			3	a few MT				
			6	several MT				
			1	about 20 MT				
			2	multi-MT				
			1	less than 30 MT				
1963	12	low	—	—	—	—	1 (9)	NS
	3	int.						
1961–1963 (6)	23	NS						
TOTAL	309	161 MT (7)	145 (8)	350 MT	23	— (7)	6 (9)	0.1 MT

U.S. Atomic Energy Commission data except where noted. (1) When specific yields are given, they represent the *total* yield for the *total* number of corresponding tests; e.g. 13 tests, 159 KT means a total yield of 159 KT for all 13 tests. But when terms such as MT, rg, low, about 1 MT, etc., are used, these terms apply to *each* of the corresponding tests; e.g. 3 tests, low means each of the 3 tests gave a low yield, and if a figure were available for "low", it would have to be multiplied by 3 to give the total yield for these tests. All yields are approximate. (2) Includes 1 safety test (testing accidental detonation). (3) Includes 2 safety tests totalling 0.8 KT. (4) Safety test. (5) Includes 14 safety tests totalling 14.8 KT. (6) Announced by President Kennedy on August 20. (7) Yield for U.S. and U.K. are combined. (8) 19 tests unconfirmed. (9) 1 test unconfirmed.

EMERGENCY SANITATION IN DISASTER

Colonel R.D. Barron, MC, RCAMC,
Director of Preventive Medicine,
Canadian Forces Medical Services
Department of National Defence

Introduction

It has been stated that the survival of the population after a disaster will depend on the ability of the emergency health services to commence preventive health activities soon enough to be effective.

Among the more important considerations that must be examined as part of the preventive health activities is the improvisation and restoration of those organized sanitary procedures, mundane though they be, which have become so automatic or taken for granted in present day living.

The Problem

The purpose of this article is to outline the problems of emergency sanitation, with particular reference to emergency sewage, waste, and refuse disposal, and to suggest some rudimentary solutions to these problems by methods which the Armed Services refer to as Field Sanitation.

In any disaster area the most pressing problems in sanitation in a very short time become:

(*a*) Disposal of Human Excreta

(*b*) Disposal of Dry Waste or Refuse

(*c*) Disposal of Liquid Waste

(*d*) Disposal of the Dead.

The problems of sanitation associated with any disaster may be varied and extreme and may appear early or may occur some time after the initial incident. Similarly, many may occur or be associated with the immediate disaster area or may occur in areas remote from the immediate disaster area.

It is therefore necessary to clearly define the problems of sanitation in their broadest sense in relation to a time frame as well as to a zonal or area distribution.

Sanitation activities must also be closely coordinated with other health service activities as well as other services in any disaster area to be effective. Sanitation services must be coordinated with the welfare and emergency feeding organizations, with emergency engineering, repair, and maintenance activities, fire fighting, rescue, transportation and traffic control.

To appreciate the problem further it is necessary to consider the subject in three logical time phases:

(*a*) A pre-disaster phase

(*b*) The survival phase

(*c*) The recovery phase—including the rehabilitation phase.

It is proposed therefore to discuss emergency sanitation on the basis of time phases.

The Pre-Disaster Phase

This is an indefinite period sometimes referred to as the planning period or period of preparation. During this phase or time period one must consider the requirement for indoctrination and training, for planning, and for stock-piling.

The effectiveness and efficiency of operations in the latter phases will be in proportion to the amount of effort put forth in the study, planning, and thought on the problems known or estimated during the pre-disaster phase. It is during this phase that such problems as the type and amount of essential commodities which would be required for a stockpile and what type of indoctrination, orientation, study, and training should key personnel receive, must be considered.

Many of these problems are receiving active consideration by various groups but no ultimate answer to all the varied problems has yet been provided

The Survival Phase

During the first few post-disaster hours, the saving of life is the all important role of medical and paramedical services. The medical effort must be united in order to provide the maximum of effort for the maximum number of people.

If it is accepted that the role and responsibility of the Armed Forces in the survival phase, is primarily concerned with re-entry into the disaster area, then the preventive medicine services of the Armed Forces should be immediately responsible for sanitation in the forward disaster area during the survival phase. It is expected that there will be a brief lag period of 2-4

days before the provincial and municipal agencies might be expected to assume responsibility for sanitation in the forward disaster area. It therefore follows that the provincial and municipal agencies should be expected to assume sole responsibility for the disaster areas during the recovery and rehabilitation phases. At the same time these same agencies must be expected to assume immediate responsibility for those support or rearward areas to which population and casualty movement will be expected to occur.

The Armed Services can be expected to maintain their normal standards of field sanitation in areas which they may occupy or work in. Preventive Medicine technicians or hygiene assistants are provided for the purpose of maintaining the highest possible standard of field sanitation in such service units. Thus human waste, dry refuse and other waste products should be disposed of by the services under the equivalent of battlefield conditions. As the refugee and casualty population are primarily concerned with exit from the area and are likely to have little or no experience or understanding of the rudiments of battlefield sanitation, a variable amount of fouling of the area may be encountered.

The sanitation problem in the rear areas at this time is paramount and will continue to increase.

Provision must be made in these areas and at interim staging areas for the disposal of human excreta, dry waste and refuse, liquid waste and sewage, emergency burial of the dead, etc.

The Recovery Phase

The sanitary problems in the recovery phase can be expected to be multiple and varied both in the forward disaster area and in the rearward or support areas and will increase directly in proportion to time. Therefore the importance of an early well planned, well organized sanitary programme is paramount.

The sanitary problems in both areas will be in proportion to the extent of the transportation of large groups of the population into a substandard environment and to the duration or extent of the period involved. In short, people with little, if any, worldly possessions will be existing on assistance provided by welfare agencies at a bare survival level and with little supervision. This therefore serves to emphasize the importance of waste disposal in such an environment.

Having outlined the likely environmental problems in space and time, some solution therefore must be offered to cope with the requirement.

Methods Of Emergency Waste Disposal

Satisfactory disposal of waste products in the field constitutes one of the most difficult tasks, yet one of the most important, since if successfully accomplished it plays an important role in conserving manpower, a most important consideration following a disaster. Sanitary discipline on such occasions must be strict and methods of disposal which are most likely to succeed are those which are simple and are based on sound principles. The golden rule should be one standard sample design with only minor modifications necessary to meet local conditions. Moreover, the standard adopted should entail the minimum provision of material and personnel.

(A) *Disposal Of Liquid Waste*

Liquid waste arising from human urine and sullage water, provide the main types requiring disposal.

Immediate requirement for disposal of urine may be by means of shallow trench urinals, which should not be used for more than 2-3 days or until trough urinals, funnel urinals, or improvised bucket urinals can be provided. Standard 8 gal. milk cans can be utilized (Fig. 1, 1A, 1B). Sullage water should be controlled

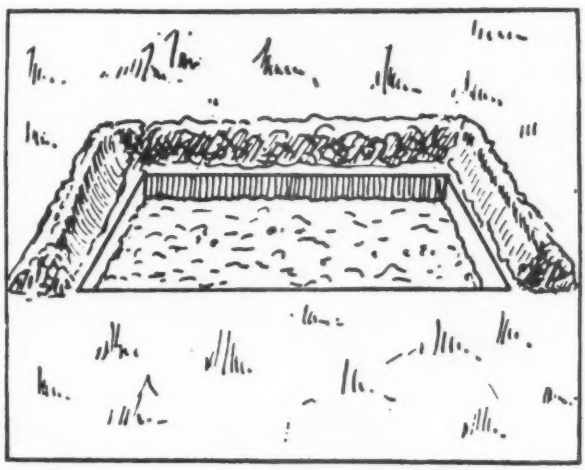


Figure 1—Shallow Trench Urinal

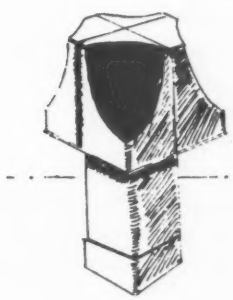


Figure 1B

Pail Urinal Improvised from Petrol Tins

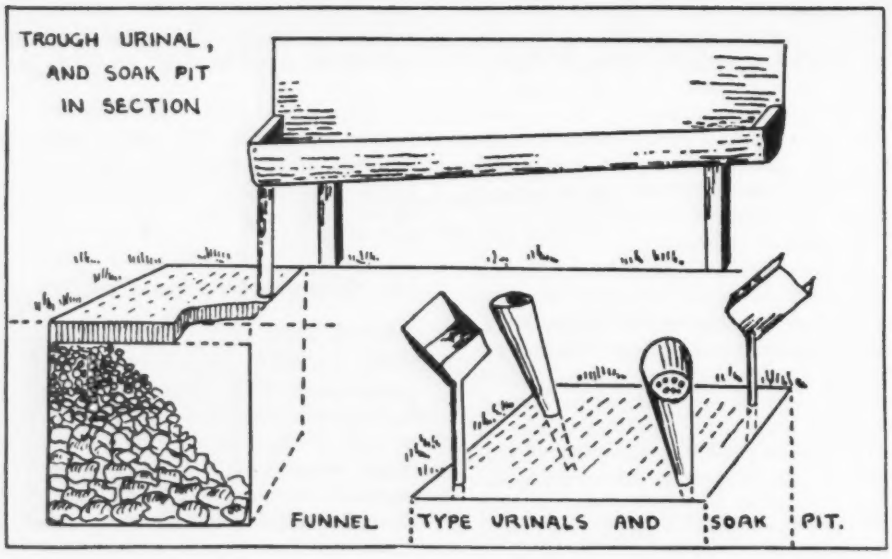


Figure 1A

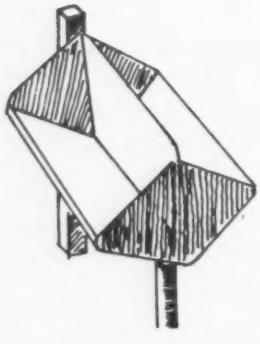


Figure 1B

Urinal Improvised from Petrol Tins

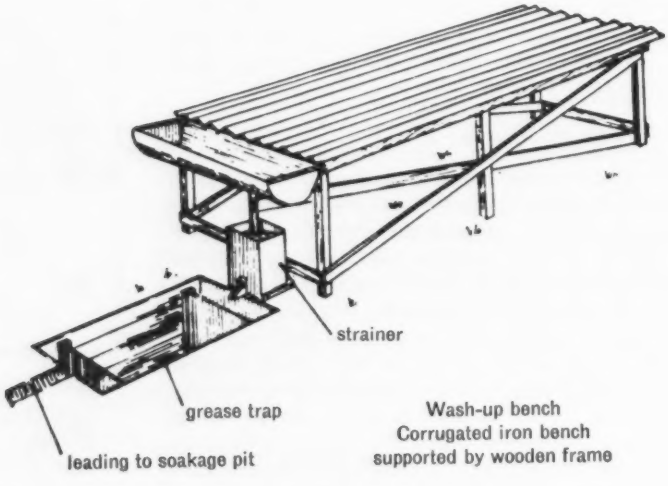


Figure 2—Washing-up Bench

by centralizing washup and ablution facilities. A simple method is by the use of a washup bench. (Fig. 2). Sullage water can usually be disposed of by running into a soakage pit but some form of preliminary straining is desirous if the soakage pit is to last for any length of time. It is important that a cold water type of grease trap be considered for prolonged sites. The eventual connection to a sewage disposal system must be considered.

While not often classed as liquid waste one must never forget the importance of providing adequate drainage around living and eating facilities, for natural rainfall. This type of waste water runoff can usually be directed to natural drainage catchment facilities.

(B) *Disposal Of Human Excreta*

The most satisfactory and simple method for short term use for disposal of human excreta is the shallow trench latrine. (Fig. 3). These should not be used for

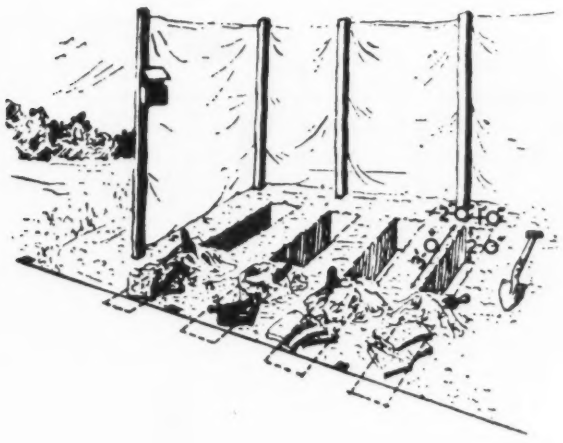


Figure 3—Shallow Trench Latrines

more than 24 hrs. For longer periods the deep trench latrine should be used. (Fig. 3A). It may not always be feasible to construct an elaborate facility for comfort. It may be necessary also on occasion to compromise between deep and shallow trench latrines. The importance of screening such facilities cannot be overemphasized.

The Middle East Portable Latrine should not be overlooked. (Fig. 3B). It is a simple, easily constructed, portable, cheap, and effective latrine. Many other types of latrines are available—bored hole, bucket or pail, etc. which may be improvised from various types of containers but require servicing, i.e., either collection or central emptying.

(C) *Disposal Of Dry Waste And Refuse*

The simplest and most effective method of disposal of dry waste is by burning, which is much more satisfactory than burial in a pit. Improvised incinerators are the most effective and safest method of such disposal and can be used to dispose of refuse. (Fig. 4 & 4A). Wet refuse i.e., food and swill, is usually more satisfactorily disposed of by pit burial. Although far from ideal, this will probably be the method of necessity in most cases where garbage disposal facilities are not available.

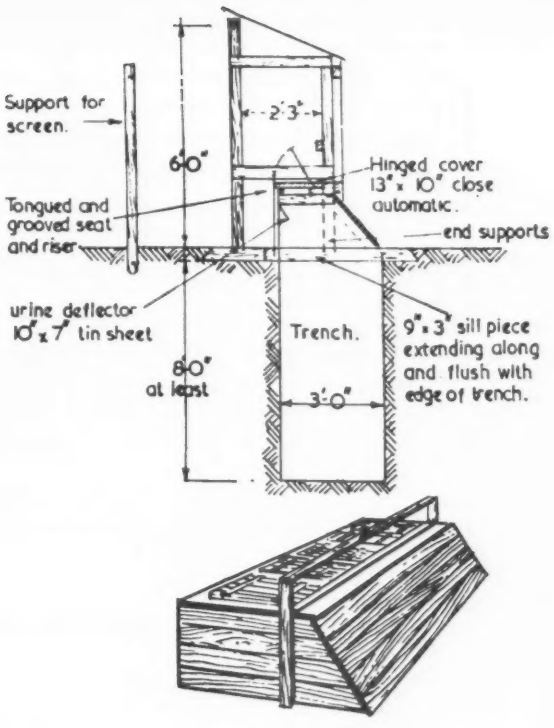

Support for screen.
2'3"
6'0"
Hinged cover 13" x 10" close automatic.
Tongued and grooved seat and riser
end supports
urine deflector 10" x 7" tin sheet
Trench.
9" x 3" sill piece extending along and flush with edge of trench.
8'0" at least
3'0"

Figure 3A—Deep Trench Latrine

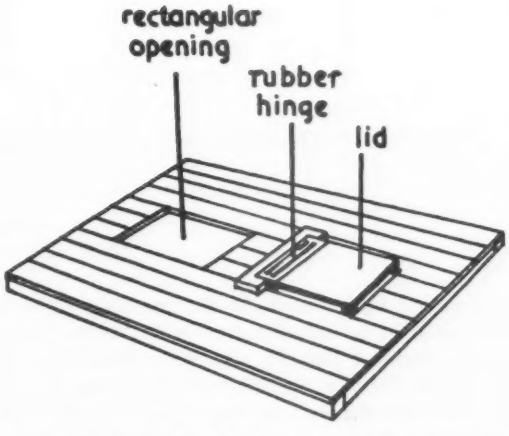
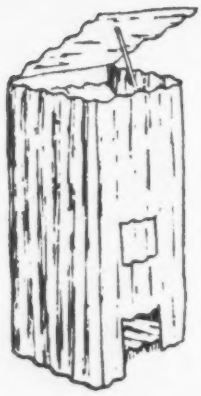


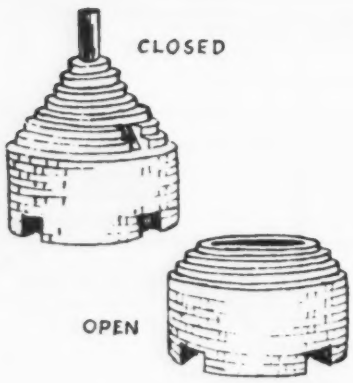
Figure 3B—Middle East Portable Latrine—Superstructure

(D) *Emergency Burial Of The Dead*

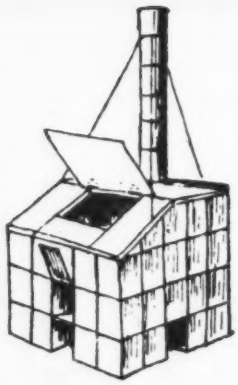
The emergency burial of the dead may present a problem in disposal. While not a true sanitary or medical responsibility, medical or sanitary advice and



Corrugated Iron Incinerator

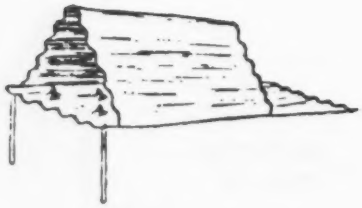


Beehive Incinerators

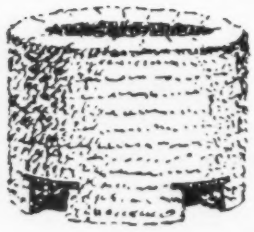


Bailleul Incinerator

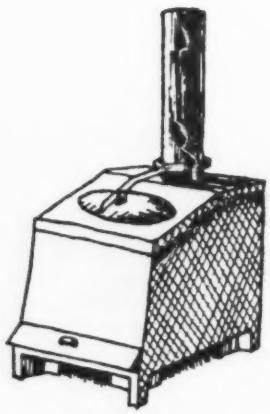
Figure 4



Inclined Plane Incinerator



Open Circular Turf Incinerator



Horsfall Incinerator

Figure 4A

direction will be required. In the immediate post-disaster period in the forward area, which is the Department of National Defence area of responsibility, Department of National Defence will not assume responsibility for identification and disposal of the dead other than for service personnel and civilian personnel employed with this force. If the magnitude of the problem is such in this period that a major threat to health of the Service population should exist, on medical advice the Department of National Defence may take action to implement mass burial without identification, in bulldozed trenches or similar facilities. This still leaves the problem of disposal of human and animal dead during the survival and recovery and rehabilitation phases, to be solved by the emergency civil administration, which will require medical and sanitary advice. Firm direction and advice in this regard cannot be stated at this time.

In considering emergency waste disposal, one should not overlook that aspect related to repair and restoration of damaged disposal systems and facilities. It is quite realistic to assume existing municipal systems, while damaged to varying degrees, may be restored. It is pointed out that under the current division of responsibility of national survival, the Department of National Defence has been assigned the responsibility for the direction of municipal and other services, and for the maintenance and repair of water and sewage systems in seriously damaged or contaminated areas.

It has been suggested by the Department of National Health and Welfare that there may be a requirement for assistance from Public Health Engineering in this field. The extent of this assistance is presently under study by the Department of National Defence.

Summary

In summary, efficient disposal of waste in an emergency situation is important to the general health of the surviving population for the following reasons:

(1) The prevention of contamination of water supplies
(2) The prevention of contamination of food
(3) Eradication of fly breeding places
(4) Control of rats and mice

Every local, municipal, or provincial emergency plan should include provision for emergency waste disposal and should include arrangements for the efficient disposal of the following wastes:

(1) Human excreta (Latrines and Urinals)
(2) Kitchen Waste (Controlled burial, incineration)
(3) Rubbish and Dry Waste (Incineration or controlled burial)
(4) Sullage Water (drains, grease traps, soakage pits)

In addition, provision where applicable, should be made for plans for emergency burial of the dead, and provision for coordination with the Department of National Defence for restoration of damaged disposal system. ▲

NATURAL DISASTERS

Since 1959, provincial or local emergency measures organizations have participated in approximately 120 natural disasters as follows:

British Columbia	15
Alberta	6
Saskatchewan	4
Manitoba	18
Ontario	10
Quebec	49
New Brunswick	3
Nova Scotia	6
Prince Edward Island	3
Newfoundland	2

Some of the more important disasters were:

1. The Chicoutimi Hospital fire in 1963.
2. The recent TCA crash outside Montreal.
3. The Lamont, Alberta, train/bus collision in 1960.
4. Various floods in Manitoba in 1962.
5. Nova Scotia forest fires of 1960.
6. The 1960 Newfoundland forest fires.
7. The Lanark fire of 1959.
8. The Windsor explosion of 1960.
9. The Greater Vancouver Area floods of 1961.
10. The forest fires in Prince Edward Island in 1960.
11. Moose Jaw floods of 1963.
12. The New Brunswick blizzard in the Spring of 1963.

The disasters reported include such activities as 'standing to' in anticipation of a possible emergency, searching for lost persons, co-ordinating disaster activities, rescue work, emergency feeding, lending special equipment such as generators, pumps, etc. ▲

SANTA FE, NEW MEXICO

CIVIL DEFENSE SYSTEM

THE City of Sante Fe, New Mexico, with a population of 34,676, has a city council form of government. The Mayor, Mr. Pat Hollis, is an elected official. Santa Fe has an eight-member city council. The City Manager, Mr. Mario Sebastian, is an appointed salaried official. Mr. John Hardesty is the appointed full-time, salaried Civil Defense Director and is assisted by one salaried employee—a clerk-typist. There are 212 city employees.

The city budget for civil defense in FY 1963 was $11,500. The Federal Government matched $4,675.00 of this sum.

Fallout Shelters

Existing Shelter Resources vs Population—

14,991 spaces

Additional shelter spaces necessary—19,685 spaces.

Shelter Marking and Stocking

31 buildings with 14,491 spaces have been licensed and marked with fallout shelter signs. 27 of the 31 licensed buildings are now stocked with Federally donated supplies sufficient for 10,390 people for a 2 week period.

New Shelter by Ventilation Improvement of Existing Building

The buildings in which shelter space was found by the National Shelter Survey can provide for 14,216. This would give Santa Fe a total of 25,889 spaces and a need for 8,787.

New Shelter by Barrier Shielding

There are 3 Federal buildings in Santa Fe, the Post Office, the new Post Office, and the Federal Court building. If [1]HR 8,200 is approved and funded, OCD will examine these structures for shelter potential based on the addition of barrier shielding.

New Shelter in New Construction

Three public buildings are now under construction. With modifications funded by HR 8200, an estimated 5,429 additional shelter spaces can be created.

Conclusion

Thus the use of HR 8200 funds would result in providing fallout shelter for virtually the entire population of Santa Fe, if private building owners provide 3,318 spaces. These 3,318 spaces can be added by ventilation improvements identified in the Survey and not eligible for federal financing. Some additional home shelters are likely as home owners focus on local shelter planning.

Shelter Managers

Sixty-one people have been assigned and trained as shelter managers for specific buildings. Each such person has responsibility for the building or responsibility to the occupants of that building. For example, Antonio J. Romero and D. D. Van Saelen have been trained as Shelter Managers for the First National Bank building in Santa Fe.

Warning

A total of 5 sirens is necessary to alert the entire population. Four of these sirens are dual-purpose fire and civil defense; 3 of them are in place and the 4th is scheduled for installation in 1964. A single-purpose civil defense siren has been approved in the current city budget and will also be installed in 1964.

Warning in the City of Santa Fe is received from the OCD Warning Center at NORAD, Colorado Springs, via the New Mexico State Warning Point at the State Police Headquarters in Santa Fe. Tests of the system in June 1963 indicate that the warning is transmitted to the State Warning Points in less than 60 seconds.

Radiological Defense (RADEF)

The City and County have 49 radiological monitoring stations which are fully equipped with radiological instruments. Of these stations 25 have two-way radio communication with the [2]EOC.

Mr. Carl Henderson, of the Radiological Section of the State Health Department, has been trained and assigned as a Radiological Defense Officer, with an emergency assignment in the EOC to direct the operations of the 49 monitoring stations. Ninety-eight radiological monitors have been trained—the number necessary for sustained operations.

Two fixed Federal monitoring stations—the Weather Bureau and the Federal Aviation Agency—are located in Santa Fe and report to both local and national authorities.

[1] HR—a bill in the House of Representatives, Washington.
[2] EOC—Emergency Operating Centre.

In January 1964 a regular Army instruction team on invitation of the State will visit Santa Fe to present a RADEF course of instruction.

Continuity of City Government

An Emergency Operating Center (EOC) is being installed in the basement of the City Hall. The City Hall building provides adequate protection against fallout for the EOC, which will cost an estimated $100 for partitions.

The 25 city-owned two-way mobile radio sets can be directed from this EOC.

Each of the 31 city public shelters has a telephone in the building for communications between the Emergency Operating Center and the shelter. The 25 mobile radio sets are being assigned to public shelters for operations.

The Emergency Operating Center has a direct telephone line to radio station KVSF, which is part of the National Emergency Broadcasting System.

Public Instruction

Thirty-one public shelters in existing buildings, of the 33 available, are marked with fallout shelters signs. The public has been informed by the Santa Fe *New Mexican* of the location of these shelters. No specific instructions have yet been issued to the population on specific shelter assignments, but a system of shelter assignment is being developed and will be published early in 1964.

The population has received civil defense training or instructions as follows:

- 240 people have completed the 12 hour Civil Defense Adult Education course.
- 110 people have completed the 16 hour Medical Self-Help course on emergency medical measures to be taken in the absence of trained medical personnel.
- During the Berlin and Cuban crises, the public was instructed through the news media on the meaning of the civil defense siren warning signals. In addition a pamphlet containing this information has been distributed to 7,000 families.

Inventory and Organization of Community Resources for Civil Defense Emergencies and Restoration

Police Department

There are 57 police officers responsible for law and order, traffic control, and periodic inspection of radiological monitoring equipment. Other shelter supplies are inspected every six months by the City civil defense agency.

Fire Department

11 full-time paid firemen plus 21 volunteers are charged with fire control, post-attack recovery and decontamination operations, as well as general damage assessment.

Medical

There are two hospitals with a total of 258 beds. There is also one CD Emergency Hospital with 200 beds stored in Santa Fe. There are 73 doctors and 18 Sanitary Engineers and 27 pharmacists.

Food

There is a 48-day supply of commercial food for the total population of 44,970 for the City and County of Santa Fe. This is based on 2,000 calories per day per individual. This period could be doubled by more austere rationing.

Water

There are 3 millions gallons per day which is fallout-proof, part of the local water system supplied by 5 wells.

Petroleum

There are petroleum stocks of 200,000 gallons, sufficient for essential transportation operations for two weeks, assuming 50 per cent of the peace-time rate of consumption.

Power

There is a local capability to generate 12,000 KW of electric power, which is required for essential operations such as ventilation systems, communications equipment, signal equipment and operating rooms. ▲

EMO NATIONAL DIGEST

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Several types of radiation measuring instruments available to provinces under a cost sharing agreement with the federal government.

Upper right: Dosimeter for measuring individual personal exposure.

Upper left: Charger for Dosimeter.

Bottom: High range radiation measuring instrument.

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